THE

PROPORTIONS

OF THE

HUMAN FIGURE.

With Six Illustrative Outlines.

BY

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PREFACE.

In the present treatise on the Proportions of the Human Frame, the text of Vitruvius is given as it appears in the best editions, the translation into English is that of the late Professor of Architecture at the Royal Academy,[1] amended from the Italian of Leonardo da Vinci; so that there is nothing new or original, but perhaps the idea of attributing them to the celebrated Canon of Polycletus.

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Lindsey House, Chelsea,
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[1] Wilkins' *Vitruvius*, London, 1812.

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VITRUVIUS POLLIO, a celebrated architect, who lived about the beginning of our era, and wrote a treatise on architecture, has preserved in that work a Canon of the proportions of the human frame, which he states was used by all the famous painters and sculptors of antiquity, and by which they attained great excellence, and acquired great and lasting praise.

We have abundant proof that the painters and sculptors of Egypt did follow certain predetermined rules in the execution of their paintings and sculptures, because the lines[1] marking the divisions prescribed by the Canons then in use,[2] are very commonly found on unfinished works, and are sometimes to be detected under the paint, in finished paintings and

[1] Sir G. Wilkinson's *Materia Hieroglyphica.* Page 113. *Malta,* 1828.

[2] Three different Canons are described by Dr. Lepsius as having been used by the ancient Egyptians, delineations of which are to be found in the great work on Egypt now in course of publication by the Prussian Government. "One belonging to the most ancient Pharaonic Monarchy; another later than the Twelfth Dynasty, when Thebes first began to flourish; a third, which appears at first, in the time of the Psametichi, with an entire alteration in the principle of the division, and which remained unaltered till the time of the Roman emperors. The last is the same which Diodorus expressly mentions in his First Book." —*Letters from Egypt, Ethiopia, and the Peninsula of Sinai,* by Dr. R. Lepsius. Translated by L. and F. B. Horner. H. G. Bohn, London, 1853.

statues. We likewise possess, in our National Collection,[1] an ancient tablet, on which is preserved an outline exhibiting the Canon of the proportions of the human frame, in use among the painters and sculptors of that country in the age of Amunophth III., about 1250[2] years before our era.

The Canon, however, which is preserved in the third book of the treatise on Architecture by Vitruvius, has not, in modern times, received the attention it deserves, partly—it is conjectured—from some obscurity in the text, and partly, from the very unsuccessful attempts at a delineation of the human figure by way of illustration, in some of the older editions. There exists, however, in the library of the Academy of Venice, a drawing[3] by Leonardo da Vinci, and a translation into Italian by that celebrated artist, of that part of the treatise of the ancient architect, which clears up the obscurity in all the existing editions, in a way that makes it probable that Leonardo must have had access to some copy of Vitruvius which has not come down to our time.

On comparing this Canon with the proportions of the Greek statues, and with the Egyptian Canons above referred to, it will be seen that Vitruvius has handed down to us, not only the most comprehensive system of the proportions of the human frame, but in all probability, the celebrated Canon of Polycletus.

[1] British Museum *Catalogue.* Page 333.

Crystal Palace *Handbook of the Egyptian Courts.*

Lepsius's *Auswahl der wichtegsten urkunden Egyptischen alterthums.*—Leipzic, bei Georg Wigand, 1842.

Gallery of Antiquities. Plate 33. Selected from the British Museum, by F. Arundale, J. Bonomi, and S. Birch. John Weale, London.

[2] Samuel Sharpe's *Chronology and Geography of Egypt.* Moxon, London, 1849.

[3] *Disegni di Leonardo da Vinci.* Milano, 1830.

Vit. Lib. iii. cap. 1.

Corpus enim hominis ita natura composuit uti os capitis a mento ad frontem summam et radices imas capilli esset decimæ partis: item manus palma ab articulo ad extremum medium digitum tantundem: caput a mento ad summum verticem octavæ: tantundem ab imis cervicibus[1]: ab summo pectore ad imas radices capillorum sextæ[2]: ad summum verticem quartæ.[3] Ipsius autem oris altitudinis tertia pars est ab imo mento ad imas nares: nasus ab imis naribus ad finem medium supercilliorum tantundem; ab ea fine ad imas radices capilli, ubi frons efficitur, item tertiæ partis. Pes

Nature, in the composition of the human frame, has so ordained that the face from the chin to the highest point of the forehead whence the hair begins, is a tenth part of the whole stature; the same proportion obtains in the hand measured from the wrist to the extremity of the middle finger. The head, from the chin to the top of the sealp, is an eighth. From the top of the chest to the highest point of the forehead is a seventh.[2] *From the nipples to the top of the sealp is a fourth*[3] *of the whole stature. If the length of the face, from the chin to the roots of the hair, be divided into three equal parts, the first division determines the place of the nostrils; the second the point where the eyebrows meet.*[4] *The*

[1] This sentence is quite irreconcilable, and not found in the translation of Leonardo da Vinci; it is therefore omitted in the English.—J. B.

[2] Vitruvius has "a sixth," but Leonardo a seventh.

"Dal di sopra del petto al nascimento dei capelli sia la settima parte di tutto l'uomo."—Leonardo da Vinci.

From the top of the chest to the top of the head is a sixth.

Both these measures determine the length of the neck. In adopting this last measure there would be the seventh part of an inch less in the length of the neck of a statue ten feet high than in adopting the former.—J. B.

[3] *Dalle tette al di sopra del capo sia la quarta parte dell' uomo.*—Leonardo da Vinci.

[4] The ear likewise is a third of the length of the face.

Le parti che si trovano fra il mento, il naso, il nascimento dei capelli e quel di ciglj ciascheduno spazio per se e simile al orecchio, il terzo del volto.—Leonardo da Vinci.

vero altitudinis corporis sextæ :[1] cubitus[2] quartæ: pectus[3] item quartæ.

foot is a seventh[1] part of the height of the entire frame; the cubit[2] and the chest[3] are each a fourth.

Reliqua quoque membra suos habent commensus proportionis, quibus etiam antiqui pictores et statuarii nobiles usi magnas et infinitas laudes sunt assecuti.

The other members have certain affinities which were always observed by the most celebrated of ancient painters and seulptors, and we must look for them in those productions which have excited universal admiration. . . . .

Item corporis centrum medium naturaliter est umbilicus. Namque si homo collocatus fuerit supinus, manibus et pedibus pansis, circinique collocatum centrum in umbilico ejus, circumagendo rotundationem utrarumque manuum et pedum digiti linea tangentur.

The navel is naturally the central point of the human body; for if a man should lie on his back with his arms and legs extended, the periphery of the circle which may be described about him, with the navel for its centre, would touch the extremities of his hands and feet.[4]

[1] *Il piè sia la settima parte del uomo.*—Leonardo da Vinci.

The foot in the best antique statues is usually more than a seventh and less than a sixth.—J. B.

[2] That is to say, from the elbow to the end of the middle finger is a fourth.

Dal gomito alla ponta della mano sia la quarta parte.—Leonardo da Vinci.

[3] "Chest," *i.e.*, the width of the shoulders across the chest.—J. B.

La maggior largezza delle spalle contiene in se la quarta partz dell' uomo. Leonardo da Vinci.

Most statues exceed one-fourth in this dimension, and Leonardo's expression, "*contiene in se,*" would seem to imply that at least a fourth of the whole height was contained in the greatest width of the shoulders.—J. B.

This measure depends so much on the character of the statue that it is subject to great variation, as well as all the other transverse dimensions of the human frame.—J. B.

N.B.—This is (the only measure of width given in this ancient canon).—J.B.

The quotations from Leonardo da Vinci are given in the orthography of the document preserved in the Academy of Venice.

[4] This is only conditionally true, for unless a man of just proportions raise his arms so that the extremity of the middle fingers touch a line even with the top of his head ("*che colle lunghe dita tu toechi la linea della sommità del capo*"—Leonardo da Vinci), and so far expand the lower extremities that he lose $\frac{1}{14}$th of his height; or, that in the space between the expanded lower extremities

Non minus quemadmodum schema rotundationis in corpore efficitur, item quadrata designatio in eo invenitur. Nam si a pedibus imis ad summum caput mensum erit, eaque mensura relata fuerit ad manus pansas, invenietur eadem latitudo uti altitudo, quemadmodum areæ, quæ ad normam sunt quadratæ. . . . .

Nec minus mensurarum rationes, quæ in omnibus operibus videntur necessariæ esse ex corporis membris collegerunt, uti digitum, palmum, pedum, cubitum, et eas distribuerunt in perfectum numerum quem Græci τελειον dicunt.

The same affinities obtain if we apply a square to the human figure; for, like the contiguous sides, the height from the feet to the top of the head is found to be the same as the distance from the extremity of one hand to the other, when the arms are extended. . . . .

[1] *The standards according to which all admeasurements are wont to be made, are likewise deduced from the members of the body; such as the digit, the palm, the foot, and the cubit; all of which are subdivided by the perfect number which the Greeks call Teleios.*

It may be necessary to remark, that the outline drawings, in illustration of the subject, are what may be called geometrical delineations of the human figure. Those who are acquainted with the laws of optics, know that it is impossible to have such a view of any solid object, nevertheless the architect finds it necessary to design such a view of the build-

may be drawn an equilateral triangle, the periphery of the circle having the navel for its centre, will *not* touch the expanded extremities.—J. B.

"*Se tu appri tanto le gambe che tu cogli dal capo* $\frac{1}{14}$*th della tua altezza.*"

The MS. of Leonardo has $\frac{1}{14}^{th}$ in ciphers, which I take to be a mistake for $\frac{1}{24}$th, particularly as $\frac{1}{24}^{th}$ agrees more nearly with his own diagram accompanying his translation.—J. B.

[1] Leonardo da Vinci begins his translation with this clause, which in all the existing editions of Vitruvius follows the description of the proportions. He then proceeds with the application of the circle to the human frame, but first determines the elevation of the arms and the expansion of the lower extremities, (without which conditions the test or application of the circle would be vain). Nevertheless, no existing edition of the author contains them. Then follows the application of the square to the human frame, and afterwards the enumeration of the minor divisions, with others, which will be found in the description of the diagrams accompanying this treatise.—J. B.

ing he is about to erect, in order to proceed with its construction, so in like manner the sculptor should be acquainted with the geometrical elevation of the human figure, in order to proceed with the construction of the model of his figure, and so likewise the painter should be acquainted with its real proportions, in order to represent them as they appear to the eye in perspective.

DESCRIPTION OF DIAGRAM I.

The Diagram I. is constructed according to the proportions laid down in the text of Vitruvius, with some additional divisions given in Leonardo da Vinci's translation, which are marked by the horizontal lines that divide the square into four equal spaces. The first, beginning from the bottom, determines the length of the leg, which it crosses at the top of the tibia. The second determines the length of the thigh, crossing the body at the bottom of the pubis. The third line crosses the chest at the centre of the nipples, and the fourth touches the top of the scalp.

The perpendiculars determine the length of the cubitus or forearm, and the hand; the former will be found to be a fourth, and the latter a tenth.

The scale at the base of the diagram shows those divisions alluded to in the last clause of the text, which are by nature distributed[1] in the following manner—viz., four digits or fingers, make one palm; four palms, one foot; six palms, one cubit; four cubits or twenty-four palms, the entire height of the man; and four cubits also make one pace[2] (fathom). These divisions constitute the human edifice.[3]

[1] *Sono della natura distribuiti.*

[2] *Quatro Cubiti fa un Passo.*—Leonardo da Vinci.

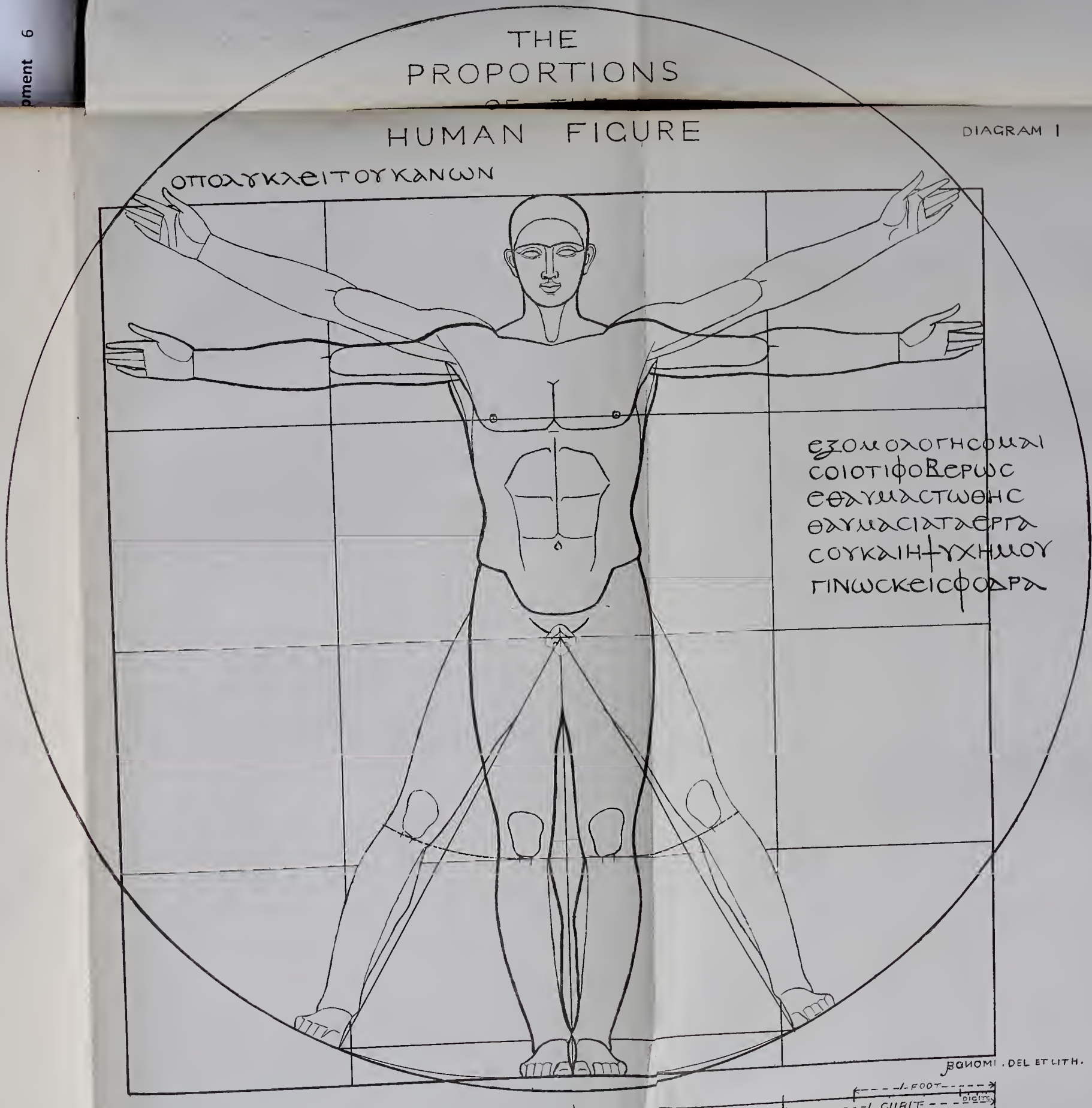
Ancient cubits. { The royal Egyptian cubit, inches . . 20·675
{ The ordinary Egyptian cubit, inches . 17·722

Samuel Sharpe's *Egyptian Inscriptions.*
Moxon, London, 1849.

[3] *E queste misure sonn', i suoi edificj.*—Leonardo da Vinci.

THE PROPORTIONS OF THE HUMAN FIGURE

DIAGRAM I



It will be observed there is no such division in this ancient Canon, as that adopted by Audran, Clarac, and all modern artists—viz., that of the head into four equal parts, and those parts into twelve minutes ; for in fact, no such division exists, the head being an eighth of the whole height, and the face a tenth of the whole height, nevertheless the scale may be applied, for each digit is equal to four minutes, and consequently three digits are equal to one part, and therefore twelve digits or three palms are equal to one head, or one-eighth of the whole height.

It will also be observed, that all the measurements of these ancient Canons, except that of the shoulder, relate to the longitudinal dimensions of the human frame, the transverse differ very considerably in every individual, and must depend on the character of the figure intended to be represented.

Three other measurements of the figure, which are marked by lines and letters on the centre figure of Diagram II., are very constantly observed in almost all the antique statues, which are nearly in the erect position—viz.,

From the heel under the inner ankle to the top of the patella, and from thence to the navel, are each equal to the distance from the pubis to the top of the chest.

Also from the same point at the heel to the middle of the patella, and from thence to the superior spinous process of the ilium, are each equal to the distance from the crest of the pubis to the top of the chest. From the bottom of the inner ankle to the top of the patella, and from thence to the spinous process of the pelvis, are equal to the distance from the acromium of the scapula on the lengthened side of the body. These three measures are very important, as they determine the great divisions of the whole figure. Perhaps they will be more intelligibly expressed by the letters of reference in the following way :—

From A to B
B to C
D to E are equal to each other.

From A to F
F to G
H to E are equal to each other.

From J to B
B to G
K to L are equal to each other.[1]

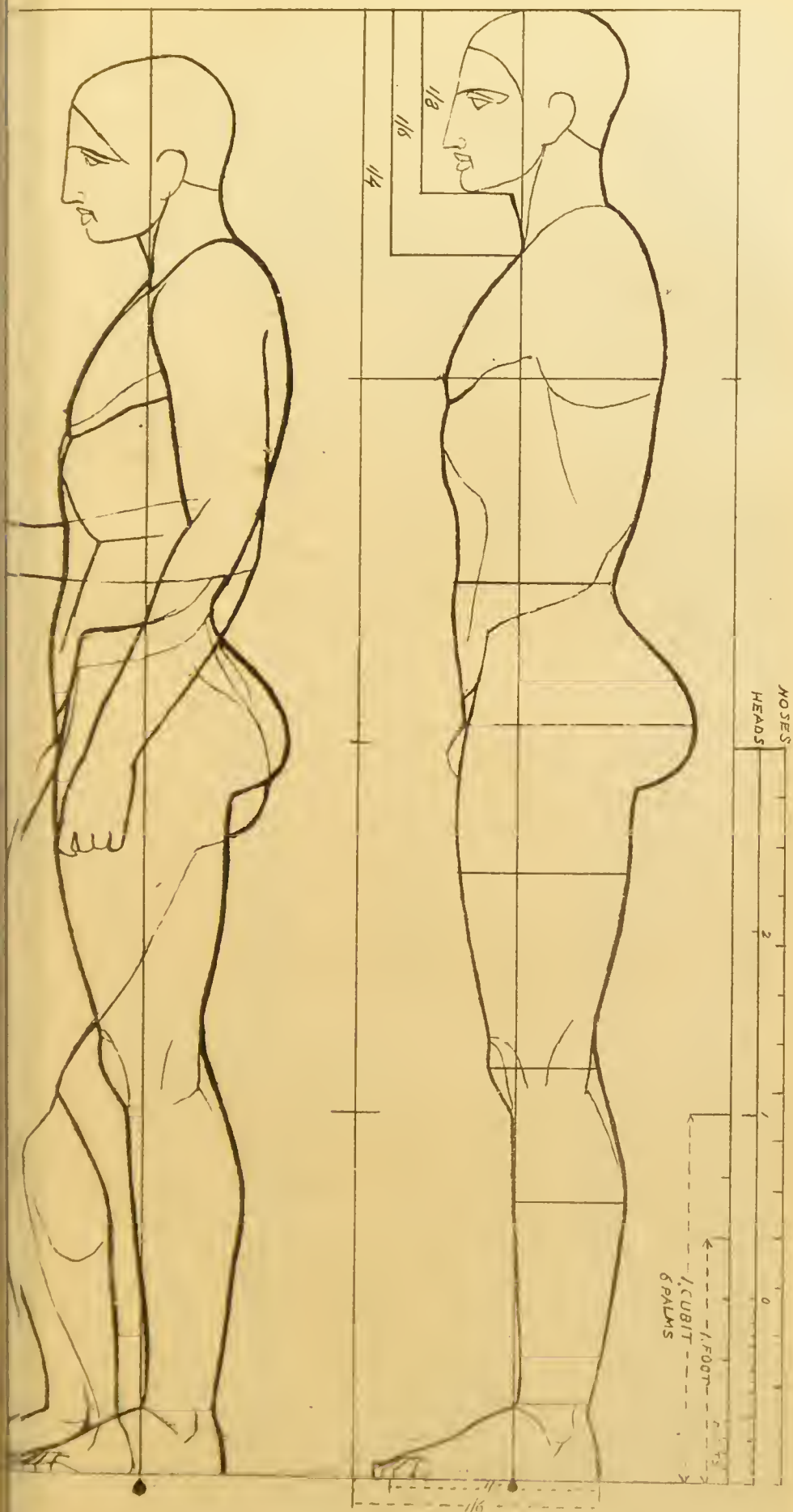
DIAGRAM II.

This diagram consists of five geometrical delineations of the human figure, two in the perfectly erect position; and a front view and two profiles of the same figure, standing at ease; that is to say, the whole weight of the body thrown on one leg. It will be seen by the application of the centre scale, at the right of the diagram, that in this ordinary position of antique statues, one-fourth of a head is lost in the height of the figure by the curvature of the spine and the obliquity of the leg, without any alteration in the size of the head, and thus it is that a statue is said to be seven heads and a half, when in fact the head may be an eighth.

The profiles of the figure standing at ease exhibit, in faint lines, the opposite sides of the figure, so that the change that takes place in the corresponding parts of the body, by reason of the position, can be more readily appreciated by the student.

The faint lines in and about the thick outline of the centre figure represent the same figure in the perfectly erect position; and it will be observed, that where, on one side, this figure exceeds the outline of the other, there is a corresponding loss on the opposite side. The centre of gravity of the erect figure is marked by the perpendicular line, which passes through the pit of the neck, and falls exactly between the ankles. In changing from the erect position to that of standing at ease, the centre of gravity passes from between

[1] The last divisions are given by Flaxman; the former by M. Clarac.


1/8
1/6
1/4
1/6
MOSES HEADS
2
1
0
1 CUBIT
1 FOOT
6 PALMS

the ankles, and should fall somewhere *within* the outline of the inner ankle and centre of the ankle, of the leg which sustains the weight of the body.

The two profile geometrical delineations of the same figure, in the perfectly erect position, exhibit the divisions prescribed by the ancient Canon. The profile to the left shows the three equal divisions of the face—viz., the first, determining "the place of the nostrils;" the second, "the point where the eyebrows meet;" and the third, "the highest point of the forehead, whence the hair begins;" which three divisions, taken together, constitute a tenth of the entire height of the figure. The next measure taken from the top of the chest to the highest point of the forehead, is a seventh of the entire height. This measure determines the length of the neck. Then follow the four great divisions of the figure marked by horizontal lines proceeding from the perpendicular, which is divided into four equal parts, in accordance with Diagram I.

The profile to the right shows the head to be an eighth of the entire height of the figure. The next measure, from the top of the chest to the top of the head, is a sixth of the entire height, and determines the length of the neck. (See note 2, page 9.)

The horizontal lines on the two profiles, and on the centre figure, mark the places where it is usual for sculptors to take the dimensions of their statues.

The following dimensions of the statue of the Achilles of the Louvre are given by M. Clarac, in his admirable work, *Musée de Sculpture Antique et Moderne*, vol. i. p. 223:—

	Heads.	Parts.	Minutes.
Profile to the left.			
Across the centre of the biceps .	0	2	$2\frac{1}{2}$
At the second line	0	1	$9\frac{1}{2}$
At the third line	0	1	$6\frac{1}{2}$
Profile to the right.			
The deepest part of the chest . .	1	0	10
Across the loins	0	3	9

	Heads.	Parts.	Minutes.
Across the glutæus	1	0	7
„ „ middle of thigh	0	3	5
„ „ „ knee	0	2	1
„ „ „ calf	0	2	4
„ „ ankle	0	1	8

Front view.

Across the shoulders	2	0	8
„ „ thorax	1	2	1
„ „ narrowest part of waist	1	1	6
„ „ widest part of thigh	0	3	2
„ „ middle of knee	0	1	11
„ „ below the knee	0	1	9
„ „ middle of calf	0	2	$2\frac{1}{2}$
„ „ ankle	0	1	4

Arm, front view.

Across the middle of the biceps	0	1	8
„ „ widest part of fore arm	0	1	10
„ „ „ „ wrist	0	1	$0\frac{1}{2}$

By a part, M. Clarac means the quarter of a head; and a minute the twelfth of a part.

THE END.